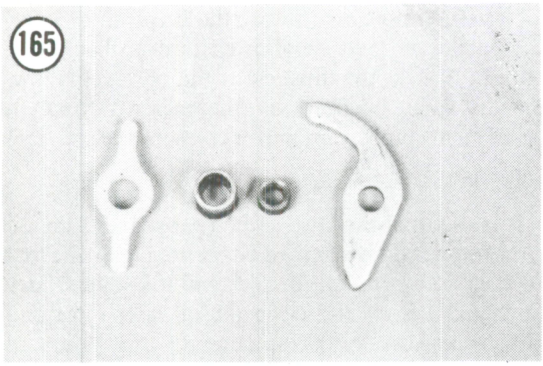

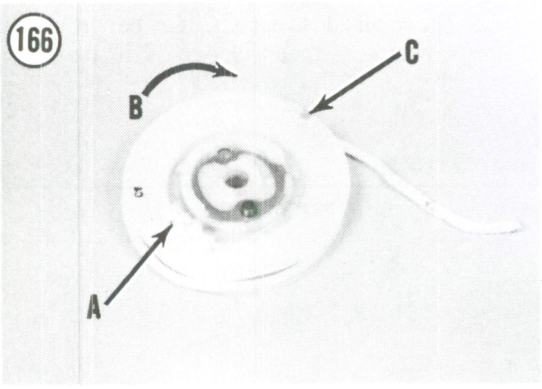

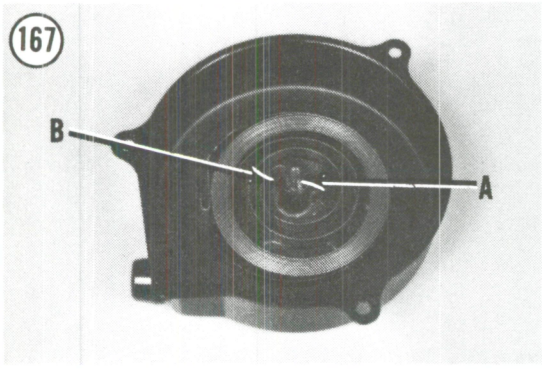

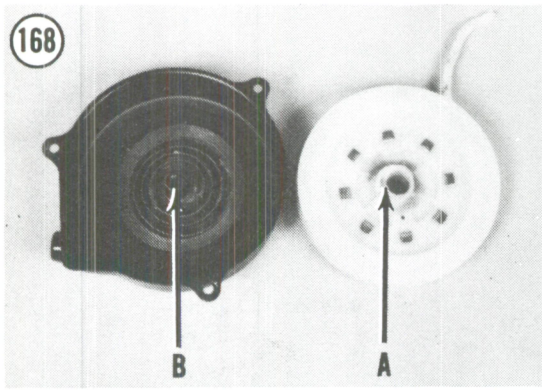

engage, remove the drive pulley and use the procedure in Step 6 and Step 7.

6. Make a *soft* wire hook (do not use stiff wire) and hook it onto the inner end of the recoil spring as shown in **Figure 152**. The other end of the hook must lay flat on top of the spring coils to allow the drive pulley to drop into position. The wire must be long enough so it can be pulled on.
7. Reinstall the drive pulley into the housing while rotating it in a *clockwise* direction. Make sure the rope is positioned up through the notch in the drive pulley. When the drive pulley comes into contact with the recoil spring, pull sideways on the hook to bring the inner end of the recoil spring away from the shaft in the housing. Continue to rotate the drive pulley and push it the rest of the way down until it seats and engages with the spring hook. Pull the soft wire hook out from between the drive pulley and the spring.
8. After engagement with the spring, rotate the drive pulley 2 turns *clockwise* to preload the recoil spring.
9. Hold onto the drive pulley and feed the rope out through the hole in the housing. Secure the rope with Vise Grips (A, **Figure 162**).
10. Apply a light coat of multipurpose grease to the ratchet and install the ratchet (A, **Figure 164**).
11. Install the friction spring and spring cover (B, **Figure 164**).
12. Install the ratchet guide onto the spring cover.
13. Install the ratchet cover and secure with the nut (B, **Figure 162**).
14. Install the rope through the starter handle and tie the end using the same special knot as shown in **Figure 150**. Apply heat to the knot (a match is sufficient) and *slightly* melt the nylon rope. This will hold the knot securely. Install the cover in the starter handle.
15. After assembly is complete, check the operation of the recoil starter by pulling on the starter handle. Make sure the drive pulley rotates freely and returns completely. Also make sure the ratchet moves out and in correctly. If either does not operate correctly, disassemble and correct the problem.
16. Inspect the slots in the starter driven pulley. If they are damaged it should be replaced.

BREAK-IN PROCEDURE

If the rings were replaced, a new piston installed, the cylinder rebored or honed or major lower end work performed, the engine should be broken in just as though it were new. The performance and service life of the engine depends greatly on a careful and sensible break-in.

For the first 5-10 hours of operation, no more than one-third throttle should be used and speed should be varied as much as possible within the one-third throttle limit. Prolonged steady running at one speed, no matter how moderate, is to be avoided as well as hard acceleration.

Following the first 5-10 hours of operation more throttle should not be used until the ATC has run for 100 hours and then it should be limited to short bursts of speed until 150 hours have been logged.

The mono-grade oils recommended for break-in and normal use provide a better bedding pattern for rings and cylinder than do multi-grade oils. As a result, piston ring and cylinder bore life are greatly increased. During this period, oil consumption will be higher than normal. It is therefore important to frequently check and correct oil level. At no time, during the break-in or later, should the oil level be allowed to drop below the bottom line on the dipstick; if the oil level is low, the oil will become overheated resulting in insufficient lubrication and increased wear.

10 Hour Service

It is essential that the oil be changed and the oil filter rotor and filter screen be cleaned after the first 10 hours of operation. In addition, it is a good idea to change the oil and clean the oil filter rotor and filter screen at the completion of 100 hours of operation to ensure that all of the particles produced during break-in are removed from the lubrication system. The small added expense may be considered a smart investment that will pay off in increased engine life.

Table 1 ENGINE SPECIFICATIONS

Item	Specification	Wear limit
General		
Type	4-stroke, air-cooled, SOHC	
Number of cylinders	1	
Bore and stroke		
70 cc	47.0×41.4 mm (1.85×1.63 in.)	
90 cc	50.0×45.6 mm (1.97×1.79 in.)	
110 cc	52.0×49.5 mm (2.05×1.95 in.)	
125 cc	55.0×52.2 mm (2.16×2.05 in.)	
Displacement		
70 cc	72 cc (4.4 cu. in.)	
90 cc	89.5 cc (5.46 cu. in.)	
110 cc	105.1 cc (6.39 cu. in.)	
125 cc	124 cc (7.6 cu. in.)	
Compression ratio		
70 cc	7.5 to 1	
90 cc	7.5 to 1	
110 cc	8.2 to 1	
125 cc	8.8 to 1	
Compression pressure (at sea level)		
ATC70, ATC90	10-12 kg/cm² (142-170 psi)	
ATC110, ATC125M	11-14 kg/cm² (156-198 psi)	
Lubrication	Wet sump	
Cylinder		
Bore		
70 cc	47.005-47.015 mm (1.8506-1.8510 in.)	47.05 mm (1.852 in.)
90 cc	50.000-50.010 mm (1.9685-1.9689 in.)	50.10 mm (1.972 in.)
110 cc	52.020-52.030 mm (2.0480-2.0483 in.)	52.06 mm (2.049 in.)
125 cc	55.000-55.010 mm (2.1654-2.1657 in.)	55.01 mm (2.169 in.)
Out of round	–	0.05 mm (0.002 in.)

(continued)

Table 1 ENGINE SPECIFICATIONS (continued)

Item	Specification	Wear limit
Piston		
Diameter		
70 cc	46.98-47.00 mm (1.850-1.8504 in.)	46.90 mm (1.847 in.)
90 cc	49.975-49.99 mm (1.9673-1.9681 in.)	49.80 mm (1.9606 in.)
110 cc	51.970-51.990 mm (2.0461-2.0468 in.)	51.80 mm (2.039 in.)
125 cc	54.955-54.985 mm (2.2029-2.1648 in.)	54.90 mm (2.161 in.)
Piston pin bore		
70 cc	13.002-13.008 mm (0.5119-0.5121 in.)	13.10 mm (0.516 in.)
90 cc	14.002-14.008 mm (0.5513-0.5515 in.)	14.04 mm (0.555 in.)
110-125 cc	15.002-15.008 mm (0.5906-0.5909 in.)	15.04 mm (0.592 in.)
Piston pin outer diameter		
70 cc	12.994-13.000 mm (0.5116-0.5118 in.)	12.98 mm (0.511 in.)
90 cc	13.994-14.000 mm (0.5509-0.5512 in.)	13.96 mm (0.549 in.)
110-125 cc	14.994-15.000 mm (0.5903-0.5906 in.)	14.96 mm (0.589 in.)
Piston to pin clearance		
70 cc	0.002-0.014 mm (0.0001-0.0006 in.)	0.075 mm (0.003 in.)
90 cc	NA	NA
110-125 cc	0.002-0.014 mm (0.0001-0.0006 in.)	0.02 mm (0.001 in.)
Piston rings		
Number of rings		
Compression	2	
Oil control	1	
Ring end gap		
Top and second		
70-90 cc	0.15-0.35 mm (0.006-0.014 in.)	0.5 mm (0.02 in.)
110-125 cc	0.10-0.25 mm (0.004-0.010 in.)	0.5 mm (0.02 in.)
Oil (side rail)		
70 cc	0.3-0.9 mm (0.02-0.036 in.)	–
90 cc	0.15-0.40 mm (0.006-0.016 in.)	0.50 mm (0.020 in.)
110-125 cc	0.3-0.9 mm (0.01-0.04 in.)	–
Ring side clearance		
Top and second ring		
70-90 cc	0.010-0.045 mm (0.0004-0.0018 in.)	0.12 mm (0.005 in.)
Top ring		
110-125 cc	0.015-0.050 mm (0.0006-0.0020 in.)	0.12 mm (0.005 in.)

(continued)

Table 1 ENGINE SPECIFICATIONS (continued)

Item	Specification	Wear limit
Second ring		
110-125 cc	0.010-0.045 mm (0.0004-0.0018 in.)	0.12 mm (0.005 in.)
Oil ring		
70 cc	0.010-0.045 mm (0.0004-0.0018 in.)	0.12 mm (0.0047 in.)
90-125 cc	NA	NA
Connecting rod small end inner diameter		
70 cc	13.013-13.043 mm (0.5123-0.5135 in.)	13.1 mm (0.52 in.)
90 cc	14.012-14.028 mm (0.5517-0.5523 in.)	14.05 mm (0.553 in.)
110-125 cc	15.016-15.034 mm (0.5912-0.5919 in.)	15.05 mm (0.593 in.)
Crankshaft		
Runout	–	0.10 mm (0.004 in.)
Connecting rod big end side clearance	0.10-0.35 mm (0.004-0.014 in.)	0.60 mm (0.02 in.)
Camshaft		
Cam lobe height (intake and exhaust)		
70 cc	26.07 mm (1.026 in.)	25.69 mm (1.011 in.)
90-110 cc	24.90-24.98 mm (0.9803-0.9835 in.)	24.6 mm (0.9685 in.)
125 cc	24.118-24.278 mm (0.9495-0.9558 in.)	23.8 mm (0.94 in.)
Cam journal OD		
Right-hand end		
70 cc	NA	NA
90-110 cc	17.927-17.938 mm (0.7058-0.7062 in.)	17.90 mm (0.705 in.)
125 cc	17.934-17.945 mm (0.7060-0.7065 in.)	17.90 mm (0.705 in.)
Left-hand end		
70 cc	NA	NA
90-110 cc	25.917-25.930 mm (1.0204-1.0209 in.)	25.90 mm (1.019 in.)
125 cc	25.932-25.945 mm (1.0210-1.0215 in.)	25.90 mm (1.019 in.)
Valves		
Valve stem outer diameter		
Intake		
70-90 cc	5.455-5.465 mm (0.2148-0.2152 in.)	5.40 mm (0.213 in.)
110-125 cc	5.450-5.465 mm (0.2146-0.2152 in.)	5.43 mm (0.2139 in.)
Exhaust		
70-125 cc	5.430-5.445 mm (0.2138-0.2144 in.)	5.40 mm (0.213 in.)
90 cc	5.435-5.445 mm (0.2140-0.2144 in.)	5.41 mm (0.2132 in.)

(continued)

Table 1 ENGINE SPECIFICATIONS (continued)

Item	Specification	Wear limit
Valve guide inner diameter		
Intake	5.475-5.485 mm (0.2156-0.2159 in.)	5.50 mm (0.217 in.)
Exhaust	5.475-5.485 mm (0.2156-0.2159 in.)	5.50 mm (0.217 in.)
Stem to guide clearance		
Intake	0.010-0.030 mm (0.0004-0.0012 in.)	0.08 mm (0.0032 in.)
Exhaust	0.030-0.050 mm (0.0012-0.0020 in.)	0.10 mm (0.004 in.)
Valve seat width	1.0 mm (0.047 in.)	1.6 mm (0.064 in.)
Valve face width		
70 cc	NA	NA
90-125 cc	1.2-1.5 mm (0.048-0.060 in.)	1.8 mm (0.072 in.)
Valve springs free length		
Inner spring		
70 cc	25.1 mm (0.99 in.)	23.8 mm (0.94 in.)
90-110 cc	26.5 mm (1.043 in.)	25.5 mm (1.004 in.)
125 cc	31.1 mm (1.22 in.)	29.9 mm (1.18 in.)
Outer spring		
70 cc	28.1 mm (1.11 in.)	26.8 mm (1.06 in.)
90-110 cc	31.8 mm (1.252 in.)	30.6 mm (1.205 in.)
125 cc	35.0 mm (1.38 in.)	33.7 mm (1.32 in.)
Rocker arm assembly		
Rocker arm bore ID	10.000-10.015 mm (0.3937-0.3943 in.)	10.10 mm (0.398 in.)
Rocker arm shaft OD		
70 cc	9.978-9.989 mm (0.3928-0.3933 in.)	9.91 mm (0.390 in.)
90-125 cc	9.972-9.987 mm (0.3926-0.3932 in.)	9.92 mm (0.3906 in.)
Cylinder head warpage	–	0.004 in. (0.10 mm)
Oil pump (all models)		
Inner to outer rotor tip clearance	–	0.20 mm (0.008 in.)
Outer rotor to body clearance	–	0.20 mm (0.008 in.)
End clearance	–	0.12 mm (0.005 in.)

NA—Honda does not provide specifications for all items and all models.

Table 2 ENGINE TORQUE SPECIFICATIONS

Item	N·m	ft-lb.
Cylinder head cover nuts		
70 cc	9-12	7-9
90 cc	20-25	14-18
110-125 cc	18-21	13-15
Cam sprocket bolt		
70 cc	5-9	4-7
90-125 cc	9-12	7-9
Cam chain roller bolt	9-14	6-10
Ignition advance unit (models so equipped)	9-12	7-9
Pulse rotor bolt (models so equipped)	8-12	6-9
Alternator rotor (bolt or nut)		
70 cc	33-38	24-27
90 cc	20-30	14-22
110 cc	65-75	47-51
125 cc	40-45	29-33

Table 3 OVERSIZE PISTON AND CYLINDER BORE DIMENSION (1981-ON ATC110, ATC125M)*

Oversize piston	Cylinder dimension
ATC110	
0.25 mm (0.01 in.)	52.27-52.28 mm (2.0579-2.0583 in.)
0.50 mm (0.02 in.)	52.52-52.53 mm (2.0677-2.0681 in.)
ATC125M	
0.25 mm (0.01 in.)	55.25-55.26 mm (2.1752-2.1756 in.)
0.50 mm (0.02 in.)	55.50-55.51 mm (2.1850-2.1854 in.)

* Honda provides service information for these models only.